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**Report  
to  
The Missouri General Assembly  
on Hazardous Waste Management  
in Missouri**

**September 1981**

**Submitted by**

**hazardous Waste Management Task Force**

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REPORT  
TO  
THE MISSOURI GENERAL ASSEMBLY  
ON HAZARDOUS WASTE MANAGEMENT IN MISSOURI

SUBMITTED BY  
THE HAZARDOUS WASTE MANAGEMENT TASK FORCE

SEPTEMBER 1981



September 30, 1981

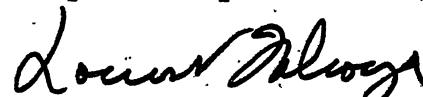
The Honorable Norman L. Merrell  
President Pro Tem  
Missouri Senate  
Room 423  
State Capitol  
Jefferson City, Missouri 65101

Dear Senator Merrell:

I herewith convey to you the report of the Hazardous Waste Management Task Force as required by statute. Over the past six months, the task force has worked to compile information and recommendations that will guide the General Assembly in its efforts to formulate safe policies regarding hazardous waste in Missouri.

We appreciate receiving comments on the report as well as guidance on any further work you wish the task force to complete.

Respectfully submitted,

  
Louis V. Holroyd, Chairman  
Hazardous Waste Management  
Task Force

LVH:cj  
cc: Representative Bob Griffin

Attachment



September 30, 1981

Representative Bob F. Griffin  
Speaker of the Missouri  
House of Representatives  
Room 308  
Capitol Building  
Jefferson City, Missouri 65101

Dear Representative Griffin:

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Louis V. Holroyd, Chairman  
Hazardous Waste Management  
Task Force

LVH:cj  
cc: Senator Norman Merrell

Attachment



Task Force Members

Representing

Dr. Louis V. Holroyd  
University of Missouri  
Chairman

Education

Ronald Kucera  
Department of Natural Resources  
Vice Chairman

Department of  
Natural Resources

Senator Allan Mueller  
6th District

Missouri Senate

Representative Wayne Goode  
68th District

Missouri House of  
Representatives

Dr. James Shaddy  
Northeast Missouri State  
University

Public

Edward MacCordy  
Washington University

Research

T. J. (Buddy) Robichaux  
Petrolite Corporation

Industry



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NOTE: Additional copies of this report are available from the Solid Waste Management Program, Missouri Department of Natural Resources, P. O. Box 1368, Jefferson City, Missouri 65102.



## I. INTRODUCTION

The Hazardous Waste Management Task Force was established by legislation enacted during a special legislative session in the fall of 1980. The purpose of the task force is described below.

"The Commission shall establish a Hazardous Waste Management Task Force. The task force shall recommend a comprehensive hazardous waste management program which minimizes the need for the disposal of such waste in the land of this state. It shall make specific recommendations for statutory and/or regulatory changes necessary to fully implement a comprehensive waste management program. Recommendations for such changes shall be made to the general assembly by September 1981. The department shall provide staff support to the task force."

(Section 260.370.4, RSMo).

To make its recommendations, the task force reviewed the current hazardous waste situation in Missouri. It met with private citizens, industry and government officials and held a public hearing (see Appendix 1) in order to assess the views of all of the groups affected by the disposal of hazardous waste.

One of the task force's initial actions was an examination of data concerning hazardous waste disposal practices. These data, drawn from industry projections and actual shipment records produced sharply varying indicators about the prevailing patterns of waste disposal. Consequently, the department, at the request of the task force, surveyed major generators to assess their disposal practices. A major conclusion to be drawn from these data is that industry is currently changing its disposal practices in response to federal and state regulations. This dynamic situation has tempered the task force's recommendations.

The state is well on its way to developing a comprehensive management program. It has in place a regulatory program, which already restricts the land disposal of some wastes, and many Missouri industries have the technical resources necessary to develop alternative disposal procedures. The success of an effort to develop a comprehensive management system will depend on the level of cooperation between state and local

governments, industry and the general public. The challenge must be addressed in a positive and open manner if the state is to develop a comprehensive management program. This positive approach has characterized the work leading to the current report.

Three major sections comprise the report. The introductory section includes a brief history of hazardous waste management in the state. The second section provides a summary of the current hazardous waste management situation in Missouri. The third section presents a series of task force findings and recommendations.

In 1976 the federal government passed the Resource Conservation and Recovery Act (RCRA) which provided for regulation of hazardous waste on the federal level. Under RCRA, states were encouraged to develop their own hazardous waste management programs. In response, the General Assembly adopted the Missouri Hazardous Waste Management Act in 1977. Regulations issued under this act became effective in July, 1980. In 1980, due to public concern surrounding applications to develop hazardous waste landfills, Governor Joseph Teasdale called a special legislative session to revise the Missouri Hazardous Waste Management Law. A chronology of the development of the current law, rules and regulations is listed in Appendix 2.

The state law now provides for control of hazardous waste using a manifest system from generation through disposal. Hazardous waste generators in Missouri are required to register with the Department of Natural Resources, keep records of waste generated and notify the state of what happens to the waste whether it is managed on-site or off-site. Generators must also use a department-licensed hauler for shipping waste, and they may manage the waste only at permitted sites.

## II. CURRENT HAZARDOUS WASTE MANAGEMENT SITUATION IN MISSOURI

To gain an understanding of the present hazardous waste management situation in Missouri, the task force requested that the Department of Natural Resources supply it with any available information. This information was supplied as data from generator registration information, manifest records and an analysis of the largest generators in Missouri. Although these data, collected for different purposes at different times, do not correlate perfectly, several conclusions can be made with a certain degree of reliability, where good agreement of information sources occurs (for a description and comparison of these data see Appendix 3). The task force has reached the following conclusions:

1. APPROXIMATELY 700,000 TONS OF HAZARDOUS WASTE ARE GENERATED ANNUALLY IN MISSOURI.

Each year approximately 700,000 metric tons of hazardous waste are generated in the state, including an estimated 45,000 metric tons of waste oil. When averaged together, the large generator analysis and the generator registration information show that 647,720 metric tons of hazardous waste other than waste oil are generated annually in Missouri.

2. 80% OF THE HAZARDOUS WASTE GENERATED IN MISSOURI IS PRODUCED BY SEVERAL LARGE GENERATORS.

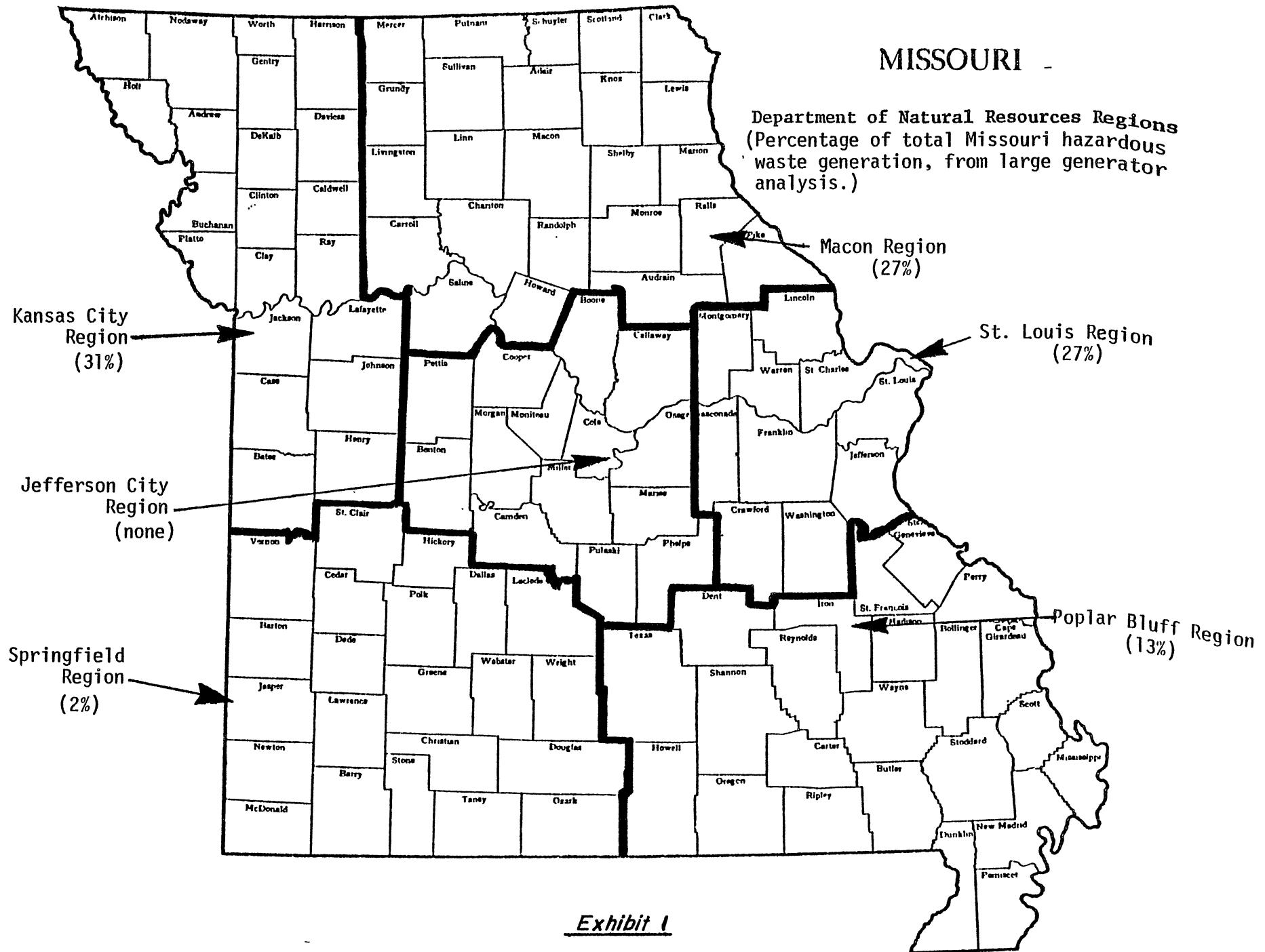
Although smaller generators are more numerous, a few large generators produce most of the waste. Nearly 80% of Missouri's hazardous waste is generated by less than 15 large generators. Furthermore, 98.3% of Missouri's hazardous waste is produced by 18.8% of Missouri's generators (only 6% if waste oil is included). Thus, most of the registered generators in Missouri are small generators--81.2% of the generators produce only 1.7% of the hazardous waste.

The United States Environmental Protection Agency (U.S. EPA) has developed considerable information on this issue, which indicates that 95% of the nation's generators produce 2.3% of the hazardous waste.<sup>1</sup> This corresponds with the Missouri information.

3. OVER HALF OF MISSOURI'S WASTE IS GENERATED IN LARGE METROPOLITAN AREAS.

The generator registration information and the large generator analysis agree that 31% of Missouri's hazardous waste is generated in the Kansas City Region and about 27% is generated in the St. Louis Region (see Exhibit 1). Thus, about 58% of Missouri's hazardous waste is produced in the Kansas City and St. Louis regions. Generators in the Macon Region produce about 27% of Missouri's hazardous waste, making the Macon Region an area of high

<sup>1</sup>Federal Register, Book 2, May 19, 1980



generation, even though it is not a large metropolitan region. Most of the waste in the Macon region, however, is a dilute solution incinerated on-site at one location. The Kansas City and St. Louis Regions account for 94% of Missouri's hazardous waste that is shipped off-site.

4. APPROXIMATELY 74% OF MISSOURI'S HAZARDOUS WASTE IS MANAGED ON-SITE.

Exhibit 2 illustrates the analysis of Missouri's largest generators and shows that the majority of Missouri's hazardous waste never leaves the property of the generator. The large generator analysis (illustrated in Exhibits 3 and 4) is presently the best source of information about on-site waste management in Missouri. This analysis, indicating that 74% is managed on-site, is in close agreement with a recent U.S. EPA publication on hazardous waste generation<sup>2</sup> which shows that 77% of the nation's hazardous waste is managed on-site.

5. OF MISSOURI'S HAZARDOUS WASTE GOING OFF-SITE, APPROXIMATELY 45% IS MANAGED IN MISSOURI AND 55% IS MANAGED IN OTHER STATES. PROPORTIONALLY SPEAKING, VERY LITTLE WASTE IS IMPORTED TO MISSOURI FROM OTHER STATES.

The large generator analysis and the manifest information closely agree that, of the waste leaving the site of generation in Missouri, 55% (approximately 71,000 metric tons per year) is destined for facilities in other states. Manifest information indicates that only about 17,000 metric tons per year is imported into Missouri from other states. Thus, over four times as much hazardous waste leaves the state as enters. Therefore, a large percentage of Missouri's waste that is managed off-site is dependent upon the actions of other states.

The remaining 45% (approximately 59,000 metric tons per year) goes off-site to treatment, disposal, and resource recovery facilities in Missouri.

<sup>2</sup>Hazardous Waste Generation and Commercial Hazardous Waste Management Capacity - An Assessment, U.S. EPA SW-894, 1980

## Manner In Which Missouri's Largest Generators Manage Their Hazardous Waste

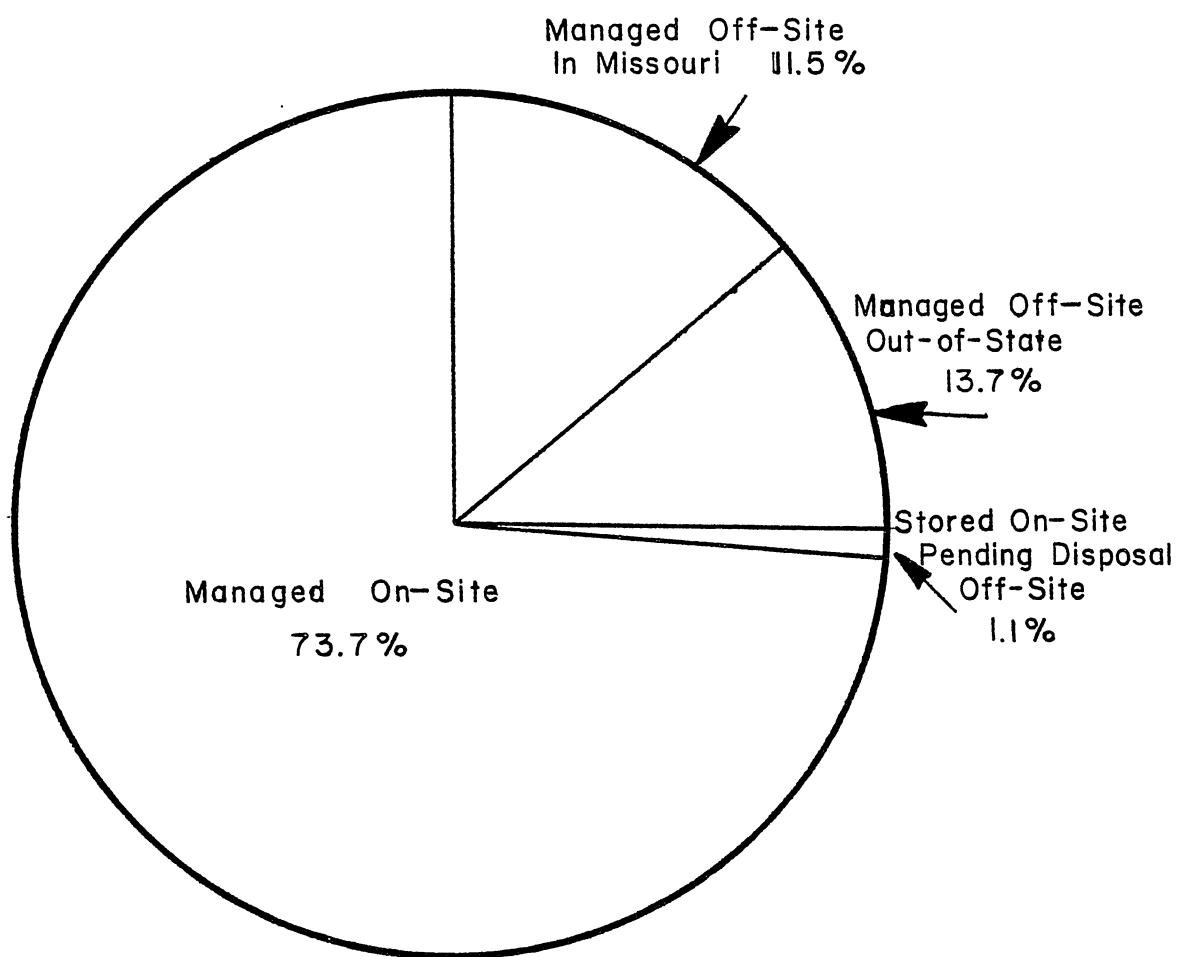
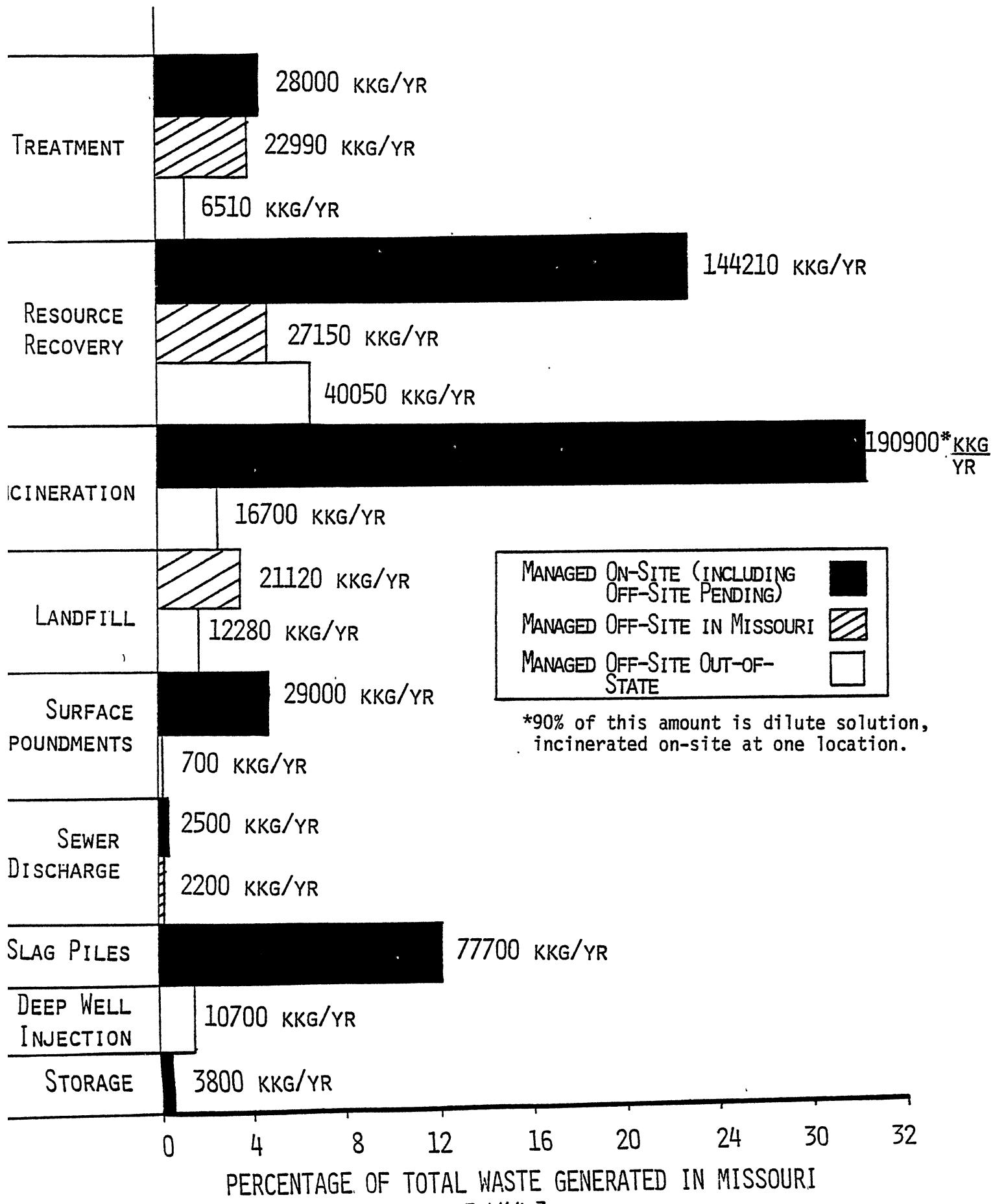


Exhibit 2

# HOW MISSOURI'S LARGEST GENERATORS MANAGE THEIR HAZARDOUS WASTE BY PERCENTAGE OF WASTE GENERATED IN MISSOURI



# HOW MISSOURI'S LARGEST GENERATORS MANAGE THEIR HAZARDOUS WASTE

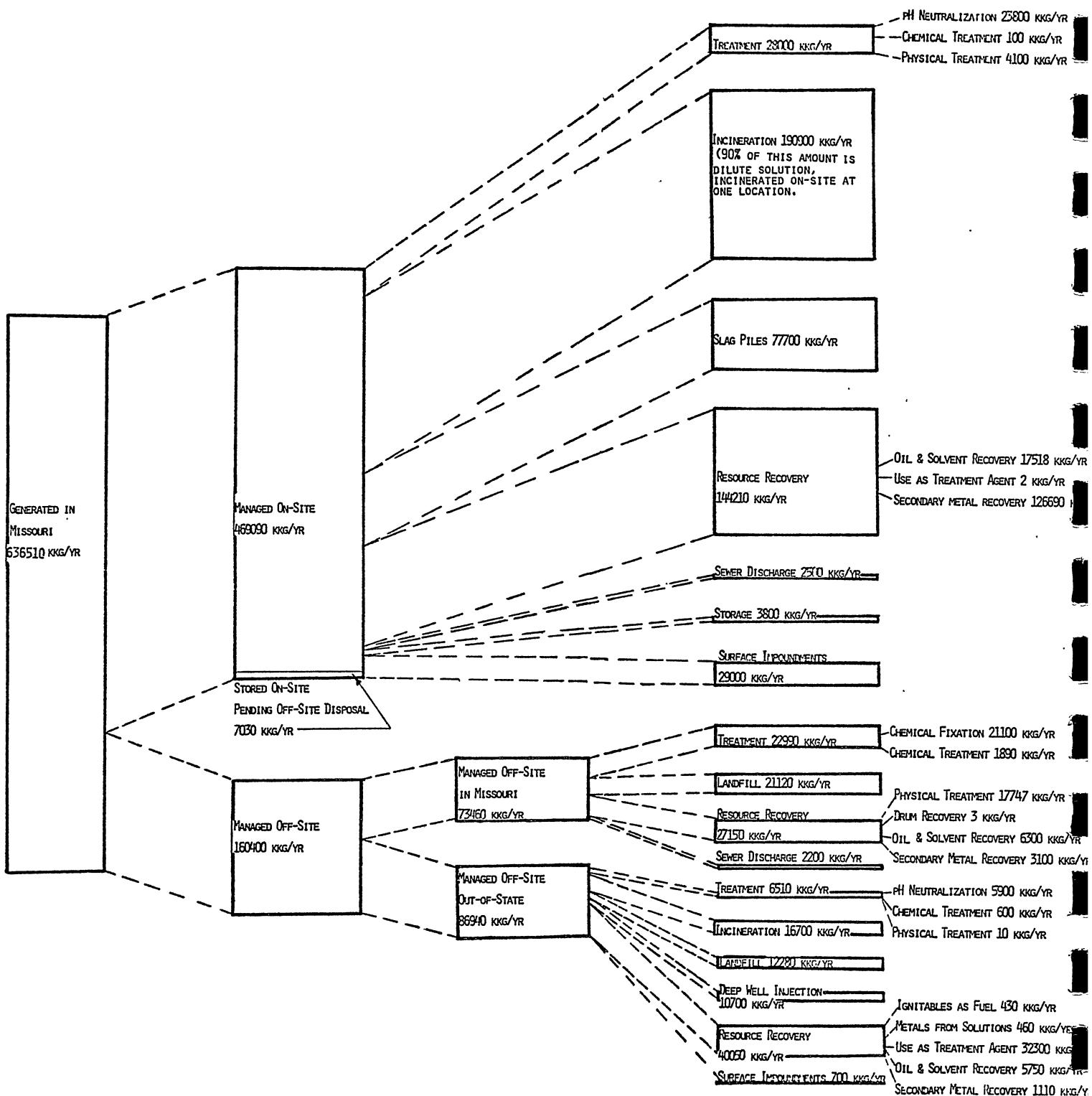


Exhibit 4

6. HAZARDOUS WASTE MANAGEMENT FACILITIES ARE AVAILABLE IN OTHER STATES AND A LIMITED NUMBER ARE AVAILABLE IN MISSOURI, HOWEVER THERE ARE NO PERMITTED HAZARDOUS WASTE DISPOSAL OR TREATMENT FACILITIES IN THE STATE.

At this time Missouri has only one secure hazardous waste landfill and one treatment facility which can legally accept hazardous waste. Neither have permits at this time, although both have applied for permits and are allowed to accept hazardous waste under the terms of variances granted by the commission. Missouri also has 24 certified resource recovery facilities which are allowed to accept hazardous waste for recycling and resource recovery purposes. The various facilities available to accept hazardous waste in Missouri and other states are listed in a Missouri Department of Natural Resources' Publication entitled Facilities Available to Missouri Industry for Hazardous Waste Management.

7. THE DEMAND FOR OFF-SITE DISPOSAL OR TREATMENT FACILITIES IN MISSOURI AND NEIGHBORING STATES TO THE WEST INDICATES THAT INDIVIDUAL STATES MAY NOT BE ABLE TO ATTRACT AND SUSTAIN A COMPLETE SET OF FACILITIES ADEQUATE TO INDEPENDENTLY MANAGE ALL OF THEIR OWN WASTE.

The U.S. EPA recently reported that Region VII (Missouri, Kansas, Nebraska and Iowa) is "projected to have the second smallest demand for off-site capacity among the 10 regions." In Region VII, Missouri is the largest producer of hazardous waste, but compared to the more industrialized states to the east Missouri is a relatively small producer. As indicated in #5 and #6 above, Missouri's present off-site capacity is small and 55% of its hazardous waste disposed of off-site is dependent on facilities of unknown future availability in other states with which Missouri has no cooperative agreements. This may indicate a need for a regional approach in the future development of hazardous waste management facilities.

8. HAZARDOUS WASTE LANDFILLED IN MISSOURI IS TYPICALLY  
SMALL AMOUNTS OF HAZARDOUS MATERIAL MIXED WITH  
LARGER AMOUNTS OF NON-HAZARDOUS MATERIAL.

Large generators, when surveyed, indicated that they planned to dispose of 21,120 metric tons in hazardous waste landfills in Missouri (see Appendix 3). Manifest information, which tracks actual shipments indicates 9,040 metric tons landfilled, and facility log records show 9,476 metric tons landfilled in the state. Of these data sources, the manifest and facility log records are considered to be the most reliable. The arithmetic average of these shows 9,258 metric tons being landfilled each year in Missouri. Generator registration data indicate that typical waste landfilled in Missouri consists of the following:

Contaminated glass, paper, cans, etc.  
Contaminated glass filter fibers  
Contaminated gravel and dirt  
Mixtures of solid inorganics and organometallics  
Contaminated filter aids (diatomaceous earth)  
Sludges (putty-like)  
Asbestos  
Waste that is not legally considered hazardous

A more complete list of the above waste is provided in Appendix 4. Because of the mixed substances in these categories, it is difficult to establish whether the waste can be safely and economically managed in some way other than landfilling.

Superficial examination suggests that a majority of the waste could be otherwise managed, but in-depth research into the technical and economical considerations should be completed before a determination is made on this issue. The University of Missouri and the Department of Natural Resources are presently making cooperative arrangements to conduct some of this needed research.

Many out-of-state hazardous waste landfills accept liquid waste -- a practice not allowed in Missouri. U.S. EPA regulations require all hazardous waste landfills that accept liquid waste

to have leachate collection and removal systems by November 19, 1981. Some out-of-state landfills may be forced to close if they cannot meet these regulatory requirements, possibly reducing the availability of landfill capacity in other states. Missouri hazardous waste landfills will surpass these regulations because 1) they are required to have leachate collection and removal systems and 2) they are not allowed to receive liquid waste.

There are a number of factors that may affect the future of hazardous waste generation, treatment and disposal in Missouri. The following are several of these important factors:

1. Shifts in on-site/off-site waste management practices of generators may reduce or increase the need for off-site facilities.
2. The demand for off-site capacity may temporarily increase due to the closing of surface impoundments and the removal of stored hazardous waste.
3. Changes in the economy will affect the growth of industry, which largely determines an increase or decrease in hazardous waste generation.
4. Increased public opposition, financial liability, and the rising costs of handling hazardous waste will prompt industry to reduce hazardous waste generation through process changes, develop on-site treatment and disposal, and explore resource recovery possibilities.
5. Changes in the regulatory classification of waste as "hazardous waste" may cause an apparent increase or decrease in hazardous waste generation.
6. The availability of facilities may decrease nationwide if facilities close because they are unable to comply with federal and state regulatory requirements.
7. The demand for off-site capacity may temporarily increase due to possible clean-up of abandoned sites under Superfund.

Many of the above factors are results of the recent regulatory actions and industry responses, both of which are unpredictable. Governmental actions introduced by task force recommendations could also give rise to changes in Missouri's hazardous waste situation. The dynamic hazardous waste environment in which this report was researched, is typical in Missouri and the nation.

### III. RECOMMENDATIONS

In its review of hazardous waste management, the task force identified five major issues and developed eleven recommendations.

#### Issue 1: Development of Alternatives to Hazardous Waste Landfills

##### Background

Missouri's hazardous waste management program has been oriented primarily toward the development and implementation of regulations governing the transportation, treatment or disposal of hazardous waste. Although the Department of Natural Resources is authorized to encourage the development of alternatives to landfilling, this function has had a low priority. The task force recognizes that it may not be possible to eliminate, but only to minimize, the need for hazardous waste landfills in the near future. However, the commission should insure that its rules and regulations are designed to achieve this objective.

It has been suggested that the state assume a direct role in the development and operation of alternative treatment and disposal centers using models proposed in other states. Advocates of this approach argue that because private industry appears unwilling to develop these facilities, the responsibility to do so falls to the state. The task force also recognizes a potential conflict of interest in the department's responsibility for both the regulation and development of hazardous waste facilities. The task force finds that the state's responsibility lies in the regulation of the hazardous waste stream and in encouraging the use of alternatives to land disposal. It does not lie in the direct ownership or operation of hazardous waste treatment or disposal facilities.

Several groups have identified the Environmental Improvement Authority (EIA) as an agency which might more appropriately promote and fund the development of alternative treatment and disposal facilities. Although the EIA has the authority to issue industry backed revenue bonds to finance facilities, it does not

have the personnel, technical expertise or statutory authority necessary to fully assume the development function. However, the Department of Natural Resources does have the necessary technical expertise and the Division of Community and Economic Development within the Department of Consumer Affairs, Regulation and Licensing, is charged with promoting industrial growth.

Finally, the task force finds that there is a need to advise the public about hazardous waste disposal processes through an educational program, to provide for technical assistance, and to encourage research and development to devise and test innovative methods of managing hazardous waste. The state's system of higher education, in cooperation with industry, appears to be well suited to conduct such a program.

Recommendation No. 1

The primary responsibility of the state should be the continued regulation of hazardous waste and the encouragement of alternatives to land burial of hazardous waste. The state should not assume the responsibility of owning or operating hazardous waste treatment or disposal facilities.

Recommendation No. 2

The Department of Natural Resources should assign a high priority to the encouragement of management alternatives to land burial to minimize the need for hazardous waste landfills. These alternatives should eliminate burial of any substance which poses a threat to the groundwaters of the state. As a part of its effort to stimulate the use of alternatives the department should identify the needs of generators, including small and intermediate generators, for alternative hazardous waste facilities in Missouri and design a plan to meet these needs either on a state or a regional basis. This plan should be submitted to the Hazardous Waste Management Commission for public hearing and approval prior to July 1, 1982. The approved plan should be submitted to the Appropriations Committees of the Missouri General Assembly on October 1, 1982.

Upon approval, the Department of Natural Resources should direct development of the required waste management facilities. Wherever possible, preference should be given to development of on-site facilities. The Environmental Improvement Authority and the Division of Community and Economic Development should assist the department in this effort.

As part of the development effort, the Department of Natural Resources should initiate an educational program to inform the public of the need for hazardous waste facilities. This program should utilize, to the fullest advantage, resources available in the state's institutions of higher education.

### Recommendation No. 3

The Department of Natural Resources should initiate a waste management research program and a technical assistance program in cooperation with the University of Missouri. This program should be designed to stimulate treatment and resource recovery while minimizing land disposal of hazardous waste.

The legislature should provide adequate seed money to initiate these programs. The University should help support research through funds presently allocated for management of the hazardous waste produced by the University system. A concentrated effort should also be made to attract support from the industries who benefit from this research and technical assistance.

### Issue 2: Operation of a Hazardous Waste Exchange

#### Background

Potentially, a hazardous waste exchange can contribute significantly to the solution of the hazardous waste disposal problem. An exchange provides a public yet confidential forum through which companies may locate another's waste which is useful in its own industrial processes. To the extent that a hazardous waste exchange facilitates the exchange of waste products, it will reduce the industrial and public burdens imposed by the use of more traditional means of waste disposal.

Since 1975, the Regional Commerce and Growth Association (RCGA) has operated a waste exchange in St. Louis. More recently the exchange was extended to Kansas City. The exchange has obtained industry support by its method of advertising waste without revealing the source.

The waste exchange operated by RCGA is not self sustaining. The modest listing fee was designed to recover only mailing costs. In addition, the task force was not presented data to indicate whether or not an effective exchange for hazardous waste is operating in Missouri. The task force believes that the waste exchange should be operated by the private sector. However, if private industry is unable to adequately perform this function, the Hazardous Waste Management Commission should become involved as directed by statute.

### Recommendation No. 4

The private sector should be encouraged to develop a self-sustaining hazardous waste exchange. It may be possible to revise the existing RCGA exchange to accomplish this. An

effective exchange should maintain a record of hazardous waste management in order to provide some measure of effectiveness. It may be necessary for the state, through the Department of Natural Resources, to provide assistance in developing such a recordkeeping system.

The Hazardous Waste Management Commission, prior to July 1, 1982, should review the effectiveness of existing waste exchanges in serving the needs of the state. If, as a result of this review, a state initiated exchange is necessary, the Hazardous Waste Management Commission should assume its responsibility as authorized by section 260.372.1, RSMo.

### Issue 3: The Missouri Hazardous Waste Law

#### Background

The regulatory environment has been in considerable flux. Missouri's hazardous waste law was not implemented until July 1, 1980 and at that time the Governor had already indicated that he planned to call a special session to revise the law. The special session ended in mid October but most of the rules were not promulgated until the spring of 1981; some have yet to be published. Further, the direction of EPA's regulatory program is uncertain as the program has been seriously questioned by the Reagan Administration.

With such a new program the identification of statutory problems will be difficult; these will only become evident after the department and the affected industries have had some experience with the program. One area, fees and taxes on the generation and land disposal of hazardous waste, appears in need of revision as the monies are inadequate to finance the administration of the law as intended. There are other areas as well that should be reviewed after the regulatory environment has stabilized.

#### Recommendation No. 5

The current law should be allowed to function without change.

#### Recommendation No. 6

Before December 1984 the Hazardous Waste Management Commission should complete a thorough review of the law. This review should identify the problem areas and recommend any needed statutory changes.

In the review of the law, the task force recommends the evaluation of the following points:

- a) the adequacy of the generator fee and land disposal tax to support the regulatory program;
- b) the extent to which these fees and taxes might be revised to encourage recycling, reclamation and process changes to minimize waste generation;
- c) the use of a progressive landfill tax (implemented over time) to discourage the landfilling of designated hazardous waste;
- d) compensation to a community to provide for costs unique to the location and/or operation of a hazardous waste facility in that community; and
- e) incentives to private operators to develop facilities in Missouri.

#### Issue 4: The Missouri Hazardous Waste Regulations

The Hazardous Waste Management Commission has moved expeditiously to promulgate rules which relate to the most pressing changes made in the law in HCS/HB's 5, 6 & 4 as a result of the 1980 special session.

There remain, however, a number of areas where rules have not been promulgated. One of these entails the statutory requirement that waste was to be categorized by degree of hazard. The task force recognizes that the commission cannot render decisions on items not presented by the department and, further, that some of the remaining issues are exceedingly complex. Nonetheless, the task force believes that the department should expedite the development of regulations establishing broad categories of waste by relative degree of hazard.

The second area requires the commission to identify waste which should not be disposed of primarily by landfilling. This provision was designed to supplement existing regulations which prohibit land burial of reactive or volatile waste, bulk liquids and organic sludges.

The third area concerns the disposal practices of infectious waste by hospitals and laboratories. Although statutory authority exists, this waste has not been regulated as hazardous waste by the U.S. EPA or the state. At the present time, the monitoring of infectious waste generation and disposal processes is carried out by the Division of Health.

Finally, the task force seriously considered recommending that the legislature provide for a formal siting board to review and act upon applications for the development of a hazardous waste disposal facility. The major potential advantage that such a board presents is the inclusion of local residents in the site evaluation process. This inclusion should insure that the concerns of the local citizens are considered and addressed to the fullest extent possible. Siting boards also have certain liabilities. One of these is that boards tend to add another layer of government to the decision making process. Another is that since siting decisions will be infrequent, boards would probably never develop the capability to render an independent decision upon any application. Nonetheless, the task force does find that there is a critical need for public involvement in the siting process. The Hazardous Waste Management Commission should use its authority under existing law to insure that the public is fully involved in the evaluation of hazardous waste disposal sites.

Recommendation No. 7

The department should develop and the commission should review rules which categorize specific waste according to degree of hazard pursuant to section 260.370.2, RSMo. Given the technical nature of this task, the commission should consider contracting with the University of Missouri, or a similar institution, for this work.

Recommendation No. 8

The department should develop and the commission should review rules specifying waste for which landfilling as the primary means of disposal is prohibited pursuant to section 260.370.1, RSMo.

Recommendation No. 9

The Hazardous Waste Management Commission in cooperation with the Division of Health should assess disposal practices for infectious waste. The purpose of this assessment is to determine whether this waste should be incorporated into the hazardous waste regulatory program.

Recommendation No. 10

The commission should promulgate rules and regulations designed to improve public involvement in the evaluation of applications for hazardous waste facilities.

## Issue 5: Funding for the Hazardous Waste Management Program

### Background

The task force anticipates that the major focus of the hazardous waste program will, within the next year, shift away from implementation of the rules and regulations. This adjustment should provide greater resources to obtain the objectives outlined in these recommendations. Nonetheless, the task force recognizes that monies produced through fees and taxes mandated by law are insufficient to fund the hazardous waste management program. Adequate funding must be provided by the legislature if the recommendations contained in this report are to be fully implemented.

### Recommendation No. 11

The task force recommends that the General Assembly adequately fund the Hazardous Waste Management Program.

Appendix 1

Hazardous Waste Task Force Public Meeting  
July 14 - 2:00 p.m., 8:00 p.m.  
Senate Lounge

Members Present: Dr. Louis Holroyd, Senator Allan Mueller, Representative Wayne Goode, Ron Kucera, Edward MacCordy, Dr. James Shaddy.

Summary:

Of those testifying, all but one opposed land burial of hazardous waste. There was general confusion concerning the difference between a hazardous waste landfill and a sanitary landfill. However, it was the position of those who testified that any landfill has the potential to become hazardous when materials are buried and not properly monitored.

The following are excerpts from testimony given at both sessions.

Joan Vehigs, Coalition for Life and the Environment, Warren County: "Putting it in the ground is not the answer."

Gene Rugh, Coalition for Life and the Environment, Warren County: Rugh stated he didn't feel the state would be capable of testing for hazardous materials because they have trouble even testing for ammonia in water. Rugh said that he tried, without success, to have the state Health Department test for ammonia. He also pointed out that a recent issue of Popular Science Magazine discussed incineration as an alternative to hazardous waste disposal. "No amount of money can be put on health and life," he added.

Representative Wayne Goode asked Representative Walker if he thought that incineration would cause as much opposition as burial. Walker answered: "Proper education as far as incineration vs. burial will help."

Linda Clardy, Excello: Clardy stated that Missourians Against Hazardous Waste propose above ground storage. "It is the out-of-site, out-of-mind attitude that we fear most. At least if it is stored above ground we can monitor it," she said. She also requested that input for siting be sought from citizens and other authorities.

Ione Kidd, Jacksonville: Kidd questioned the logistics

of transporting waste to rural areas. She stated that urban areas, where most hazardous waste is produced, are better equipped to handle and dispose of waste. She pointed out that Illinois has laws that prevent the siting of a hazardous waste disposal facility in a county with less than 228,000 people.

Senator David Doctorian, Macon: "Burial is dangerous; it must be discontinued," stated Doctorian. He added that burial has the potential to threaten water supplies. "The longer we wait, the more painful the solution will be," he said.

Joe Eigner, Browning-Ferris Industries: Eigner presented the only testimony in favor of landfilling as a proper disposal method of hazardous waste. "What is the role of the grave in this cradle-to-grave system?" he asked. Eigner said he has seen recycling systems that don't work, and neutralization and detoxification systems that are nothing more than a front for dumping. Later he said: "Landfills aren't out-of-site, out-of-mind. In many cases, they are safer (than alternative disposal systems)." Eigner said he supports having large treatment facilities that serve a region. "I don't want the countryside scattered with small sites. I prefer a handful of large sites where the federal government can manage properly." He also stated that deep-well injection of hazardous waste (which has been banned) has one of the best records of any method for handling dangerous materials. He said that deep-well injection may be the best way to handle liquids.

Sharon Rogers, Warren County Citizens Committee: Rogers said enforcement is a problem. DNR grants variances, yet they are inadequately staffed to really know what is going on.

Hazel North, Wright City: North stated her health has been affected because of the hazardous waste site in Wright City. She stated that the direction of the wind determines whether she will be sick. She also said her condition greatly improves when she is away from the area.

Mary Sue Toedebusch, Warren County Citizens Committee: Toedebusch read a letter from Representative Russell Brockfeld saying that burial is not the solution. She also read a letter from the Future Farmers of America stating that the waste resulting from our standard of

living must be dealt with.

Delores Froelich, Wright City: She stated that we can't make a decision on hazardous waste management based on economics because we can't put a price tag on health and the environment.

Sue Behrens, Shelby County: Behrens requested a clarification to the statement that the operators of a disposal site cannot be responsible for occurrences resulting from an "Act of God." "Is a 12-inch rainfall considered an act of God?" she asked. She stated, that people may tolerate alternatives if there is the strictest of monitoring, if the program is presented to the citizens, and if the state works with the citizens to implement the program.

Pat Everman, Foristell: Everman voiced the concern that the state will not be capable of testing for contamination in water supplies. "If the state doesn't have the equipment to test for ammonia, how can they test for hazardous waste?"

Gerald Miller, Missourians Against Hazardous Waste: "People are not being heard. They're not being listened to," Miller said, adding that the state should take action when they find an applicant is lying. "When they find an applicant is lying, why isn't that the end of operation by that applicant?" he questioned.

Mat Eichor, LaPlata: Eichor stated that the state needs to be more specific about terms when talking about hazardous waste. He suggested a classification system similar to those used when classifying narcotics, where the "most likely to be abused" drugs (in this case, chemicals, etc.) are designated and dealt with accordingly. He also suggested that the same agency not be in charge of site selection and application review.

John Kauffman, Excello, Missourians Against Hazardous Waste: Kauffman suggested that the regulation of waste handling begin at the source. "The state must know how much and what is being manufactured." Kauffman repeated the position of MAHW that disposal of hazardous waste should begin at the state level. The state should take one material at a time, and rank it by volume and by danger. Kauffman presented a list of proposals to the task force that included offering tax incentives for industries to reduce waste at the sources (with on-site treatment facilities eligible); having the Internal Revenue

Service consider a hazardous waste facility as a pollution control facility so that tax-free bonds can be issued; and requiring industry to treat and recycle, or to exchange waste either in an on-site, state-approved facility or a state-controlled (but not operated) hazardous waste management facility. He repeated a statement made by an attorney in the Kansas Attorney General's Office: "Hazardous waste is too dangerous to be dealt with privately."

Kauffman also pointed out that leadership from the legislature and the governor is needed to promote industry cooperation and the establishment of a state-approved facility for hazardous waste management.

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The following is a dialogue between Representative Goode and Kauffman:

Goode - Do you feel that the law is comprehensive and one of the stronger laws in the country?

Kauffman - No, it runs about average. Missouri has better landfill control than many other states.

Goode - Do you agree that the ability to control a waste product - if one stays within the law - is strong?

Kauffman - Yes. The law would work if everyone followed it. It's apparent that there is a tremendous gap though.

Goode - Do you agree that classification authority provides the commission with the authority to dictate the method of disposal?

Kauffman - The commission does have the authority to establish the disposal program.

Goode - Then the legislature has done its task in giving the commission the legal wherewithal to determine how the various hazardous waste will be disposed.

Kauffman - Yes. And it should be the legislature's position to make sure that happens.

Goode - I feel the legislature has gone as far as it can in granting authority to the commission to dispose of waste in a responsive manner.

Kauffman - I basically agree. Maybe a policing program and guidelines should be established - guidelines in the statutes.

Jim Davis, Environmental Improvement Authority: "Everyone wants it in someone else's backyard," said Davis. "You gentlemen are going to have to bite the bullet. What are we going to do? Hang it in a tree and let it rot like the Indians used to do to their dead?" Davis said. He pointed out that West Virginia recently received a federal grant to study the use of abandoned mining lands for hazardous waste disposal.

Sue Martin, Atlanta: She testified that incinerators may raise questions, but may not cause as big a problem as landfilling to farmers. "Maybe because we are farmers, we hate to see the land wasted." Martin proposed that the waste be stored above ground since technology is rapidly changing and it is possible that, within the next few years, technology may be able to adequately take care of the waste, if it is kept above ground where it is accessible.

Dialogue between Goode, Martin and Holroyd follows:

Goode - With technology changing daily, the legislature has given the hazardous waste commission the authority to deal with this situation. They have the authority to prohibit landfilling of any hazardous waste in which there is another suitable method of disposal. The reasons it (the authority) is given to the commission is because, as you have indicated, technology is changing daily.

Martin - Then why are we burying anything?

Goode - Because some waste can't be neutralized.

Martin - But the commission could say no landfilling whatsoever?

Goode - They have the authority to determine what waste can be disposed of in some manner other than landfilling. For those that can be handled only by landfilling, there is a position to recommend landfilling.

Martin - Then what is the purpose of this task force?

Goode - This task force is to make recommendations to the commission on whatever methods are necessary to further eliminate the burial of hazardous waste.

Martin - Right, I'd like to see the committee recommend no burial of hazardous waste at all.

Goode - Where there is some other method of disposal.

Martin - No, none.

Goode - Well, there are some things at this point technology can't do anything else with. We're leaving the decision to the commission. We're all against landfilling when there is something else to do with the waste. We've given the commission all the authority they need to prohibit burying where it's technically feasible.

Holroyd - One must consider the sources of metals; they originally came from the bowels of the earth. How do you propose they be returned to the environment?

Martin - Anything that is a health hazard shouldn't be buried.

Holroyd - Well, there are natural problems such as lead, the Lord made them problems. To have a blanket edict against burial bothers me a little because the proper way to handle some materials is to return them to the earth.

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Joe Eigner: Eigner stated that above ground bunkers and storage are interesting alternatives to disposal, but they require so much monitoring. The materials are safer in the ground, he said. He also suggested that a third party evaluation of permits be established and that grievances against existing sites be properly dealt with.

Joan Vehigs: She again testified that waste materials should only be put back in the ground when they are in the same condition they were in when they were taken from the ground. She said people would feel safe with incineration if the process was properly monitored and protected.

Mary Sue Toedebush: She repeated that incineration and de-toxification, with proper monitoring, could gain support.

Appendix 2

History of Hazardous Waste Management

October 1976

Federal Resource Conservation and Recovery Act of 1976 passed by Congress (PL 94-580).

June 1977

Missouri Hazardous Waste Management Act passed by the 79th General Assembly (HB 318).

May 1978

Missouri Hazardous Waste Management Commission appointed.

May 1978 to November 1979

Rules and regulations prepared by the Hazardous Waste Management Commission.

January 1, 1980

Publication of State Hazardous Waste Rules and Regulations.

May 1980

Environmental Protection Agency published federal rules and regulations.

May to December 1980

Special Study Committee on Hazardous Waste established by House Resolution No. 407. The committee was composed of the Environmental Improvement Authority, the Department of Natural Resources and interested citizens and organizations.

July 1, 1980

Effective date for State Hazardous Waste Regulatory Program.

September 3, 1980

Special legislative session on Hazardous Waste convened.

Appendix 2, continued

September 28, 1980

Sites operating prior to passage of state law required to obtain a new permit or a variance to continue operating.

October 31, 1980

Governor Joseph P. Teasdale signed the Hazardous Waste Management bill into law (Conference Committee Substitute for House Bills Nos. 5, 6 and 4).

November 2, 1980

Special legislative session on Hazardous Waste adjourned.

November 19, 1980

Effective date of federal rules and regulations. Missouri's program was found to be consistent with the Environmental Protection Agency's program after some revisions in the rules. Missouri subsequently entered into a cooperative agreement with the U. S. EPA.

November 1980 to Present

Missouri Hazardous Waste Management Commission revising rules and regulations. (The delay in revising state rules and regulations is partially attributable to the slowness with which the Environmental Protection Agency has written and published rules and regulations on the federal level.)

February 1981

Hazardous Waste Management Task Force members appointed.

July 1981

State rules and regulations implementing HCS/House Bill Nos. 5, 6 and 4 became effective.

September 1981

Hazardous Waste Management Commission granted variances to the state's only operating hazardous waste landfill and to an existing treatment facility.

Hazardous Waste Management Task Force Report submitted to the General Assembly.

## Appendix 3

### Description and Correlation of Data

Several sources of data have been examined by the task force. In those areas where the data agree, a number of conclusions were made and presented in Section II of this report. While formulating conclusions, the task force was aware that the data sources did not correlate in every instance. This awareness prompted the task force to evaluate the data more carefully before making conclusions or recommendations.

The difficulties encountered while developing the data served as a reminder of the infancy of the present Hazardous Waste Management Program in Missouri.

The data sources are arranged in four columns on the accompanying table. The methods by which hazardous waste is managed are listed on the side of the table and the correlation of the numbers can be visualized by reading across the four columns. Where the numbers agree closely, an average is provided on the right side of the table. The following questions and answers are designed to explain issues which might originate from the table:

Q: What is a metric ton?

A: A metric ton is a long ton or 2,200 pounds.

Q: What hazardous waste information was used by the task force?

A: The task force examined the generator registration information, large generator analysis, manifest information and the facility log records.

Q: What is the difference between the generator registration information and the large generator analysis?

A: Generator registration information is based on the registration forms required after July 1, 1980 from all hazardous waste generators. At that time, the generators estimated and predicted how their waste would be managed and the quantities they would generate. Although some generators have updated these records, most records reflect how generators said they would manage their waste in July of 1980.

The large generator analysis, on the other hand, was conducted in June and July of this year. This was

Correlation of Hazardous Waste Information

How Hazardous Waste Generated in Missouri is Managed:	Generator Registration (Metric Tons/Yr)	Large Generator Analysis (Metric Tons Yr)	Manifest Information (Metric Tons/Yr)	Facility Log Records (Metric Tons/Yr)	Comments
1. Managed In Missouri	425,140	549,570	-	-	487,355 - average of I & II
- Landfill	91,670	21,120	-	-	
- Incineration	70,820	190,900	-	-	
- Resource Recovery	47,350	171,360	-	-	
- Treatment	23,560	50,990	-	-	
- Sewer	6,330	4,700	-	-	5,515 - average of I & II
- Surface Impoundment	67,740	29,000	-	-	
- Storage	117,670	81,500	-	-	99,585 - average of I & II: Includes slag piles
A. Managed On-Site in Missouri	-	476,110	-	-	
- Landfill	-	-0-	-	-	No landfills on-site in Missouri
- Incineration	-	190,900	-	-	
- Resource Recovery	-	144,210	-	-	
- Treatment	-	28,000	-	-	
- Sewer	-	2,500	-	-	Dilute and treated waste discharged to sewer
- Surface Impoundment	-	29,000	-	-	
- Storage	-	81,500	-	-	Includes slag piles
B. Managed Off-Site in Missouri	-	73,460	44,730	-	59,095 - average of II & III
- Landfill	-	21,120	9,040	9,476	
- Incineration	-	-0-	-0-	-	No incineration off-site in Missouri
- Resource Recovery	-	27,150	12,290	-	
- Treatment	-	22,990	34,260	12,623	Column III includes material which the department considers non-hazardous; Column IV includes only hazardous waste
- Sewer	-	2,200	2,140	-	2,170 - average of II & III; sent to treatment plant
- Surface Impoundment	-	-0-	530	-	
- Storage	-	-0-	140	-	Includes slag piles

How Hazardous Waste Generated  
in Missouri is Managed:

	Generator Registration (Metric Tons/Yr)	Large Generator Analysis (Metric Tons/Yr)	Manifest Information (Metric Tons/Yr)	Facility Log Records (Metric Tons/Yr)	Comments
2. Managed Off-Site in Other States					
- Landfill	233,790	86,940	54,860	-	70,900 - average of I, II & III
- Incineration	36,300	12,280	20,140	-	16,210 - average of I, II & III
- Resource Recovery	17,330	16,700	5,870	-	13,300 - average of I, II & III
- Treatment	68,260	40,050	22,740	-	
- Sewer	100,020	6,510	-0-	-	
- Surface Impoundment	-0-	-0-	-0-	-	
- Storage	-0-	700	-0-	-	
- Deep Well Injection	11,880	10,700	6,110	-	9,563 - average of I, II & III; Deep wells not allowed in Missouri
3. Total Generated in Missouri	658,930	636,510	-	-	647,720 - average of I & II

accomplished by Department of Natural Resources' staff contacting larger generators by telephone to determine how they were presently managing their waste and verifying some information supplied in generator registration forms. After 40 generators, who produce approximately 90% of Missouri's waste, were surveyed, the results were compiled as the current findings for Missouri's largest generators in the summer of 1981.

Q: Why are no data provided in Column I "Generator Registration" for "Managed On-Site in Missouri" and "Managed Off-Site in Missouri"?

A: Unfortunately the generator registration forms do not indicate whether the waste is managed on-site or off-site in Missouri. The combination of on-site and off-site management is included in "Managed in Missouri."

Q: Why does Column III "Manifest Information" include data only for "Managed Off-Site in Missouri" and "Managed Off-Site in Other States?"

A: Manifest information is based on the manifest document used when hazardous waste is transported. Since July 1, 1980 hazardous waste that is shipped must be accompanied by a manifest document, must be shipped by a Department of Natural Resources' licensed transporter, and must utilize only a permitted facility. The data in the table reflects manifest information from July 1, 1980 to July 1, 1981. Since manifests are required only when waste goes off-site, they can provide no information about on-site management or what is generated in the state.

Q: Why does Column IV "Facility Log Records" only include two numbers?

A: Facility log records are documents listing the wastes accepted at an off-site facility. Since Missouri has a secure hazardous waste landfill and a chemical fixation and solidification treatment facility, these logs are reflected in Column IV. Off-site resource recovery facilities are beginning to maintain logs also. There are no other off-site facilities. The data in the table are based on log records from July 1980 through April 1981.

Q: Why doesn't the information correlate perfectly?

A: As was mentioned earlier, the generator information is largely based on forms submitted between January and July of 1980. It is very likely that the management practices of generators have changed since then. The "Total Generated

in Missouri" correlates well between Columns I and II, while the waste management methods do not, further suggesting that generators have changed waste management methods since July of 1980. The correlation of Columns II, III and IV is similarly affected. These sources of data were all taken at different times and adjusted to annual generation figures. The information sources were not originally intended to provide a strict agreement between the amounts generated and disposed. Generator registration does not distinguish on-site management from off-site management and manifest information is available only for waste going off-site. The large generator analysis was descriptive of how waste generated in Missouri is managed, but includes only 40 generators. Both the generator registrations and the large generator analysis are based on estimations of quantities made by the generators. However, the manifest records and facility log records reflect the actual amounts shipped and received at facilities.

Q: What is the Department of Natural Resources doing about this?

A: The Department of Natural Resources is working with the data on a daily basis, to improve correlation of the information. The Department of Natural Resources has plans to undertake a re-registration of the generators, which would seek to solve problems that have been experienced in past data. Furthermore, reports from the generators regarding on-site waste management practices will be submitted as required. Also, the Solid Waste Management Program will soon receive a computer terminal to process hazardous waste data quicker and more efficiently.

In addition to this, the regulatory environment and industry responses to regulatory actions should begin to stabilize in the future.

## Appendix 4

### Typical Waste Landfilled in Missouri

Chemical Resistant Glass Fiber 90-99+%

Acid 1-5%

Water 1-5%

Iron Sulfates <1%

Chemical Resistant Glass Fiber 90-99+%

Oil, Tar 1-5%

Carbon (500+) 1-5%

Chemical Resistant Glass Fiber 90-99+%

Urea 1-5%

Oils (Plasticizer) 1-5%

Carbon 1-5%

Chemical Resistant Glass Fiber 90-99%

Brine (salt + water) 1-5%

Sulfuric Acid 1-5%

Chlorinated Organic Impurities <1%

Chemical Resistant Glass Fiber 90-99+%

Ammonium nitrate 1-5%

Ammonium sulfate 1-5%

Carbon 1-5%

Barium and Calcium Sulfates 1-5%

Waste dusts, floor sweepings  
(99+% inert clays)  
(minute traces of organic contaminants)

Paper bags, cardboard containers (contaminated with remnants of technical products), broken glass bottles, cans, pails, plastic bottles, rubber gloves and respirator filter cartridges (95+% paper products) (minute traces of organic contaminants)

Hi Flow Super Cel filter cake sludge  
Potassium Hydroxide <0.1  
Phosphoric Acid <0.1  
Aqua Ammonia <0.1  
Muriate of Potash <0.1

2-Chloro, 2,6-Diethyl-N-(Methoxy) Acetamilide <20%  
Monochlorobenzene <5%  
Gravel and dirt balance >75%

Solvent or paint rags, empty paint cans, paint brushes, masking tape or paper with paint, paint arrestors, absorbent compound used to soak up spilled oil, solvent, paint or gasoline.

Waste paint sludge (latex, epoxy, enamel, polyurethanes, lacquer, acrylic and zinc chromate primer)

Asbestos insulation

Calcium/sodium stearate >96%  
Lead <4%

Iron phosphate 45.5%  
Zinc 2.5%  
Sludge water 50%

Iron oxide 40-50%  
Sulfuric acid >1%  
Water 40-50%  
Dirt, grease, oil 5%

Water 30-70%  
Volatile residue 2-20%  
Calcium 2-16%  
Fluoride 2-10%  
Magnesium 2-10%  
Silicon/silicate 5-10%

Arsenic contaminated glassware 20-70%  
Arsenic contaminated paper 20-60%  
Arsenic contaminated protective clothing 10-30%  
Arsenic contaminated ducting 0-20%

Sludge containing:  
Disulfoton 10-20%  
Diethyl salt 10-20%  
Toluene 4%

Phosphorus as  $P_2O_5$  30-45%

Aluminum as  $Al_2O_3$  15-25%

Silicon as  $SiO_2$  5-15%

Sulfur 65-95%

Dimethyl disulfide 0-2%

Resins (Alkyd, Phenolic, Epoxy) 85%

Pigments (Iron, Organics, Chrome) 10%

Fiberglass 5%

Triaryl phosphate ester <60%

Mineral oil <40%

Diatomaceous earth filter aid <70%

Graphite and inert solids <30%

Triaryl phosphate ester <60%

Diatomaceous earth filter aid <50%

Graphite and inert solids <25%

